

## ATTACHMENT 9 CLOSURE PLAN [40 CFR 264.110-264.115; R315-8-7]

### 9.1 INTRODUCTION

This Closure Plan describes closure performance standards and procedures to close the Munitions Management Device, Version 1 (MMD-1) at the end of the test program. The activities and closure performance standards described in this Closure Plan apply only to Resource Conservation and Recovery Act (RCRA)-regulated wastes and MMD-1 components. This Closure Plan describes the activities to effect clean closure of the MMD-1 system, including: methods to identify contaminated MMD-1 system equipment items and associated structures, methods to decontaminate any contaminated MMD-1 system equipment items and associated structures, disposition of all wastes and contaminated materials, verification sampling to confirm decontamination, and closure certification.

#### 9.1.1 General Description

The MMD-1 is a mobile treatment system designed to treat (detoxify) chemical agents and industrial chemicals contained in recovered non-explosively configured munitions. The MMD-1 system will be tested at U.S. Army Dugway Proving Ground (DPG), Utah, and will be located inside Building 3445 at the Carr Facility. Building 3445 is a test facility consisting of two test chambers, the East Chamber and the West Chamber. The two test chambers are located side-by-side, are equally equipped, share a common design and construction, and have the same dimensions (approximately 40 feet wide by 70 feet long and 16 feet high). Both chambers will be used in the test activity. The East Chamber will house the MMD-1 system and the West Chamber will be used to store reagent product and as a less than 90 day waste storage area. **Figure 9-1** presents a general layout of the MMD-1 system at Building 3445, and **Figure 9-2** presents a layout of the MMD-1 system inside Building 3445, East Chamber.

The MMD-1 consists of several utility systems and the following process systems: munition unpack [Unpack Area (UPA)], load, and unload system; reagent processing system; liquid processing system; high pressure wash system; liquid waste system; gas processing system; and waste gas system and relief system. The MMD-1 is also equipped with a carbon filter to purify air vapors leaving the process trailer. The MMD-1 process trailer houses the treatment equipment; the control trailer consists of a control room, monitor room, electrical room, and a storage area. The control trailer contains the operator interface terminals to remotely control the treatment operations in the process trailer.

The MMD-1 system will be tested using non-explosively configured, recovered non-stockpile and reconfigured stockpile chemical warfare materiel (CWM) and Department of Transportation (DOT) cylinders containing nerve agents isopropyl methyl phosphonofluoridate (GB), O-ethyl S-(2-diisopropylaminoethyl) methylphosphonothioate (VX), distilled mustard agent (HD), and the industrial chemical phosgene. The CWM items selected for use in the MMD-1 test will be stored prior to processing in a portable storage magazine known as the Munition Service Magazine (MSM). The MSM will be located at the southeast corner of Building 3445 adjacent to the Building 3445 East Chamber (see **Figure 9-1**). The MSM will be permitted under the RD&D permit, as storage of the CWM is incidental to treatment. Post-treatment wastes and other MMD-1 process wastes will be temporarily stored in less than 90 day storage areas pending shipment offsite to a permitted commercial treatment, storage, and disposal facility (TSDF) for further treatment and/or ultimate disposal. Less than 90 day storage waste areas will be located in the West Chamber of Building 3445, the UPA, and southeast of Building 3445 on AA® Street.

A detailed physical description of the MMD-1 system, associated equipment, and structures including the UPA and MSM is provided in Section 5 of this permit application. **Figure 9-3** is a general schematic of the MSM, and **Figure 9-4** is a general schematic of the UPA.

### 9.1.2 Closure Strategy

The MMD-1 system and associated structures will be clean closed. The MMD-1 system and associated equipment and structures addressed in this closure plan are:

- \$ MMD-1 process trailer and treatment equipment including the surge tanks
- \$ MMD-1 equipment/utility skids (15 skids)
- \$ UPA
- \$ MSM
- \$ Building 3445 West Chamber, temporary (< 90 day) waste storage area.

The less than 90 day waste storage area located southeast of Building 3445 on AA@Street will continue operating by DPG after MMD-1 test activities are concluded and, therefore, it is not addressed in this closure plan.

Closure activities will be conducted in a manner that will protect both human health and the environment, and minimize and/or eliminate the need for further maintenance at the MMD-1 test area. Upon completion of clean closure, there will be no hazardous chemical residues remaining on the MMD-1 system, the process trailer, the UPA, MSM, or the less than 90 day storage area at the Building 3445 West Chamber.

Prior to initiating closure and activities to demonstrate clean closure, the following will be conducted:

- \$ After the last munition is processed, a 5 percent bleach solution will be flushed through the MMD-1 system [reagent storage tanks, munitions treatment vessel (MTV), liquid reactor vessel (LRV), charge tank, surge tanks, and associated piping] followed by a clean water rinse. In addition, the MTV exterior around the four hatch openings and the UPA work areas (work bench and drain pan, glovebox, and saw table) will be manually wiped down with a 5 percent bleach and detergent solution followed by a clean water wipe down.
- \$ Reagent supply containers and reagent transfer pump will be disconnected, then removed from Building 3445. If unused reagent is discarded, it will be managed properly.
- \$ All MMD-1 treatment residues and other process wastes, including rinse waters and tank sludges, will be collected, containerized, and removed from Building 3445. Wastes will be properly characterized as outlined in the waste analysis plan, and shipped offsite to a permitted TSDF.
- \$ Personnel involved in closure activities of the MMD-1 system will be trained in applicable health and safety procedures, use of decontamination and sampling equipment, proper decontamination techniques and sample collection, handling, and management.

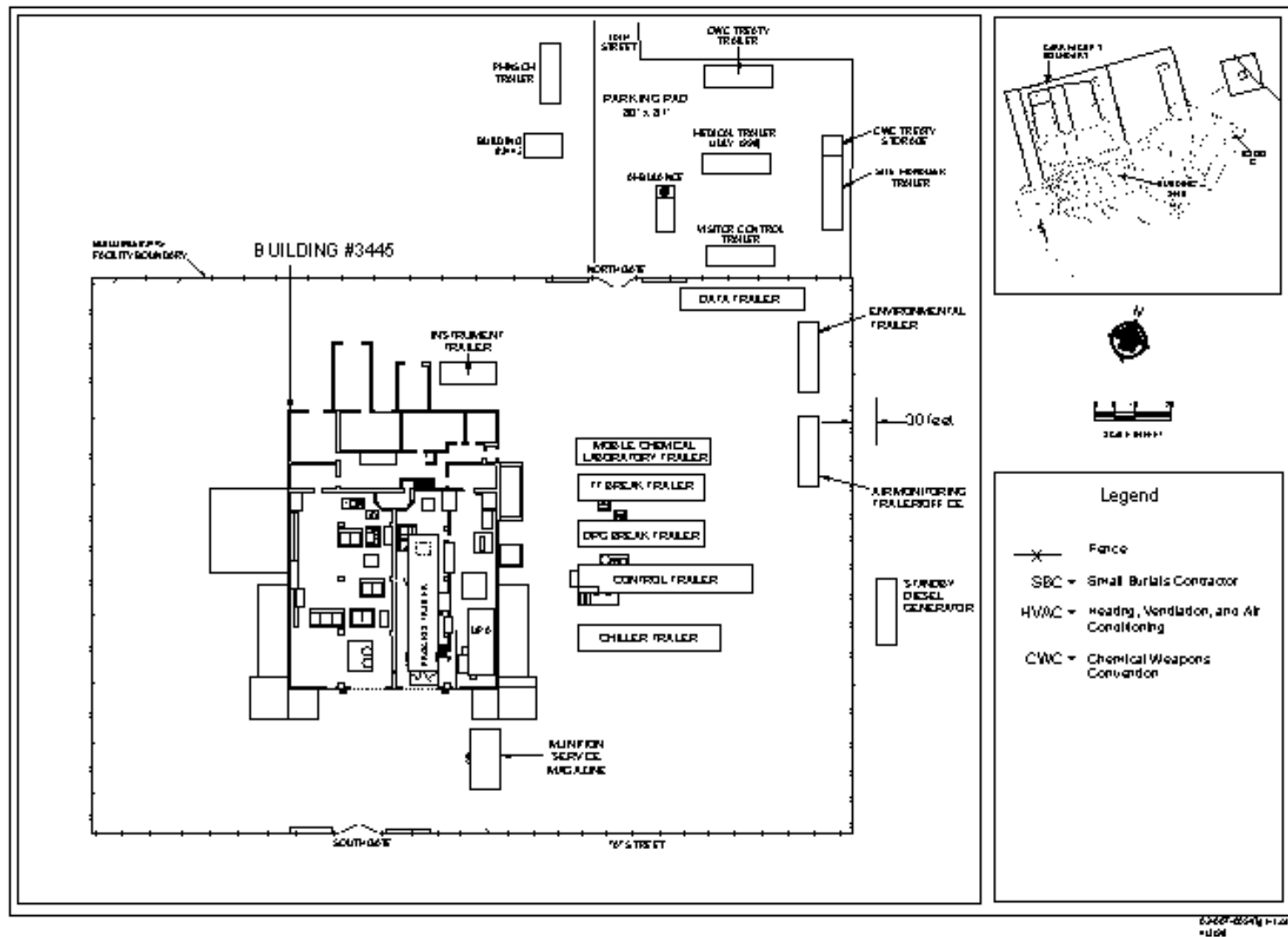
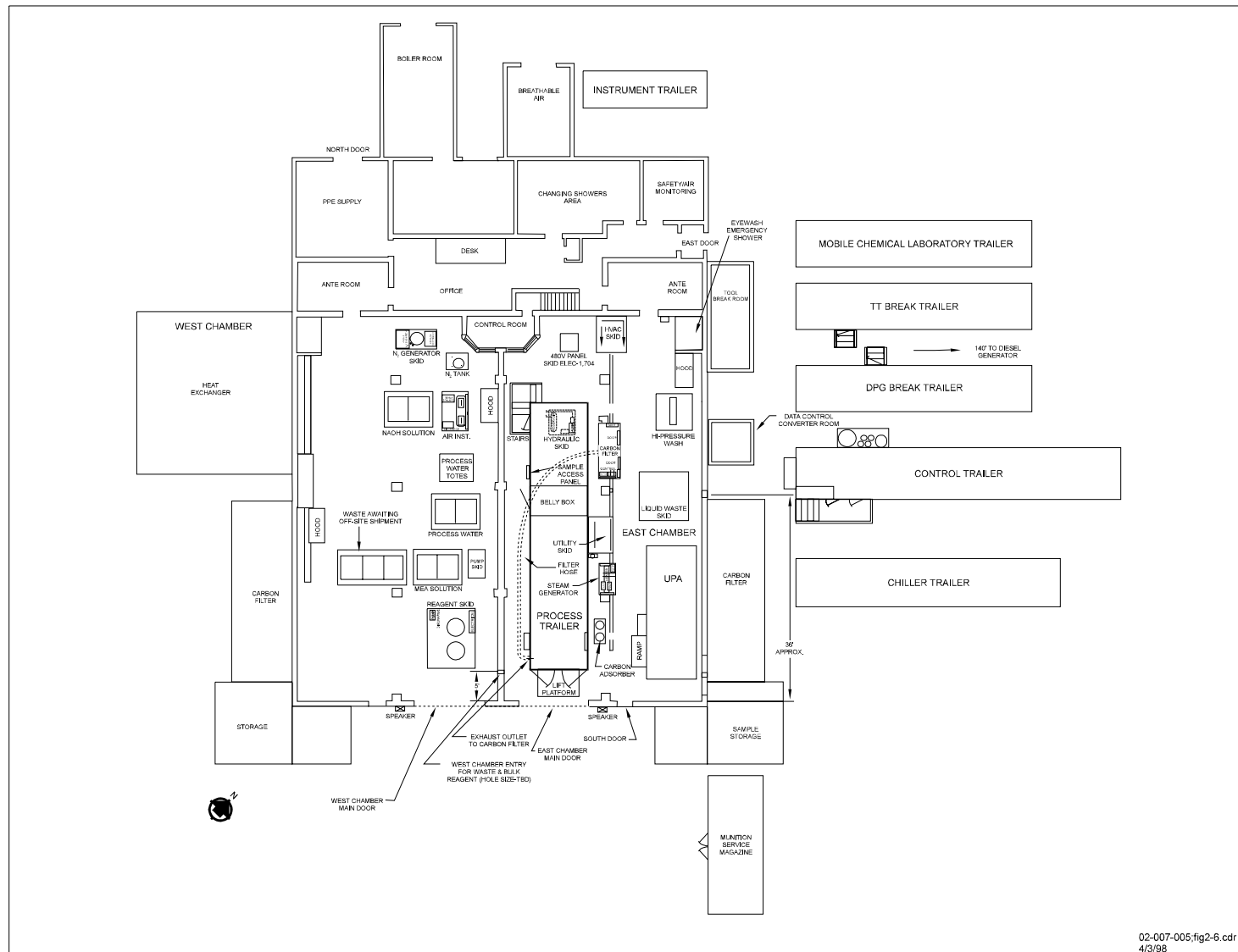
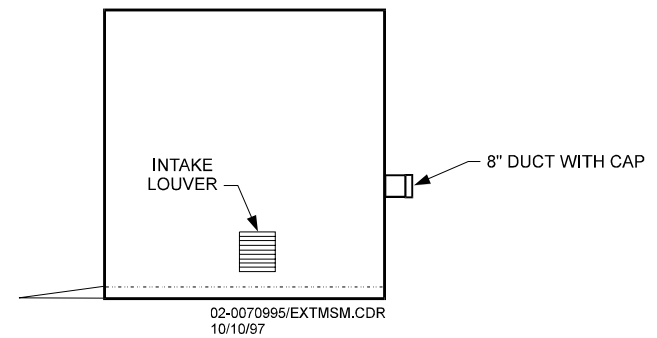
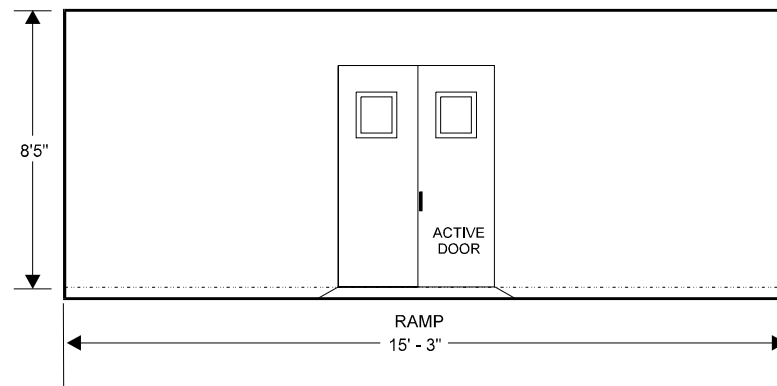
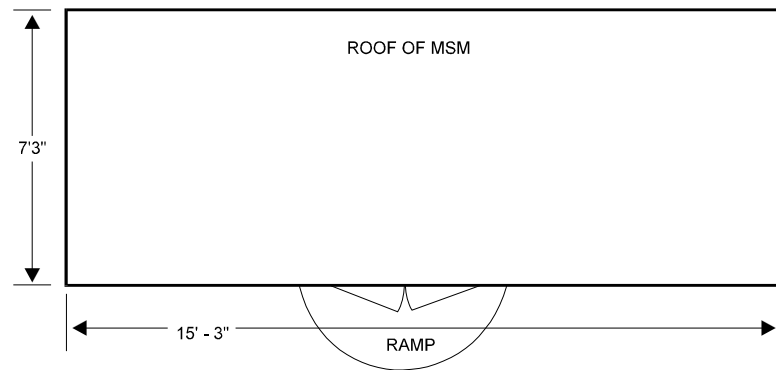


Figure 9-1. General Layout of the MMD-1 at Building 3445



**Figure 9-2. MMD-1 Equipment Layout at Building 3445 East Chamber**



**Figure 9-3. General Schematic of Munition Service Magazine**

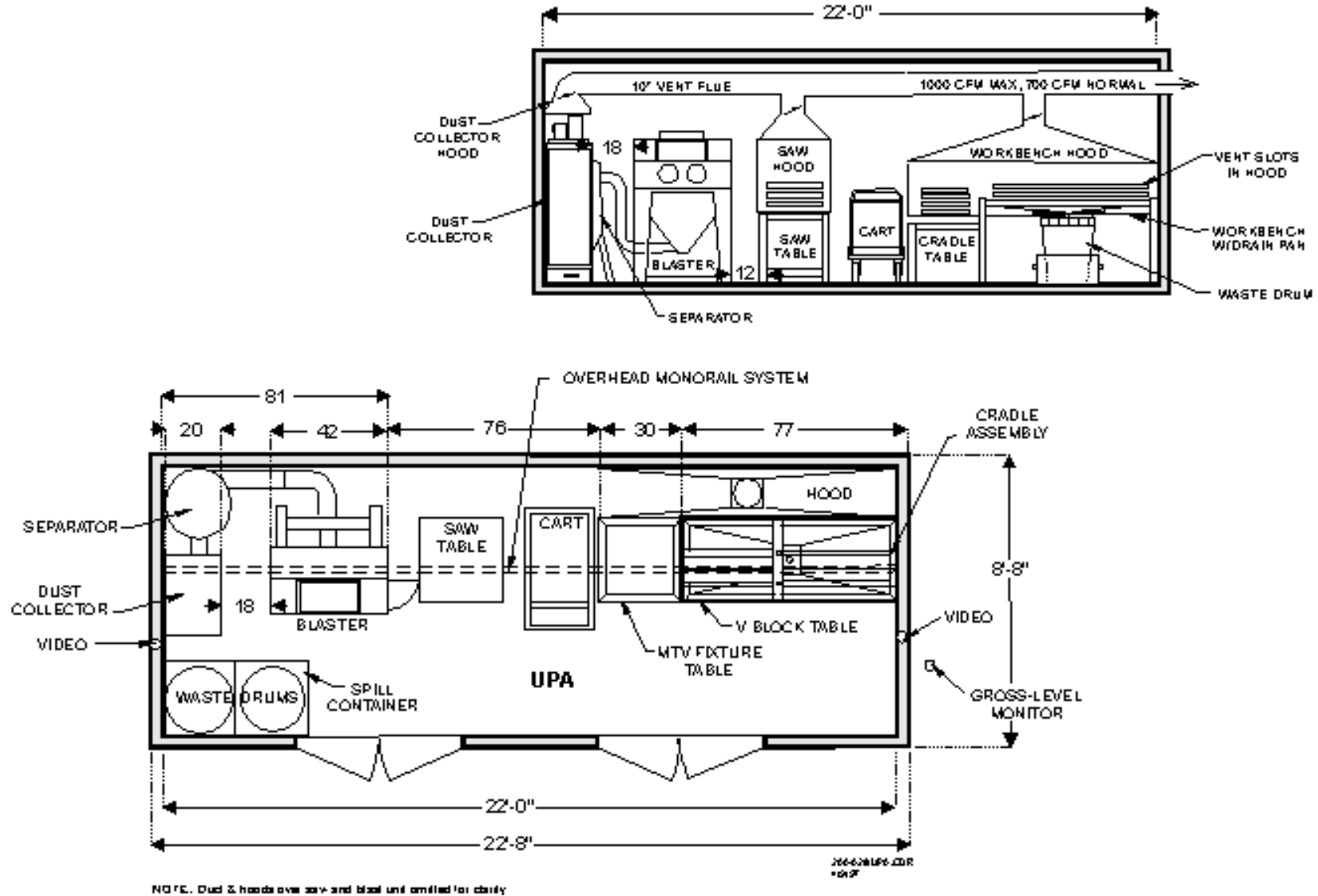


Figure 9-4. General Schematic of the Unpack Area

Closure and clean closure verification will be performed in a phased approach that involves:

1. Identifying areas or equipment items contaminated with chemical agent or phosgene. This identification will be based on air monitoring analytical results, a review of the operating log, inspection records, and process knowledge, which will identify the likelihood of agent or phosgene contamination (for example, the site of a documented spill during testing).
2. Decontaminating and cleaning of equipment items contaminated with chemical agents, or phosgene. Based on the identification described above, the following areas may require surface decontamination followed by air monitoring to verify decontamination: 1) spill areas; 2) unpack area; 3) MTV munitions load and unload areas; 4) less than 90 day waste management area inside Building 3445 (UPA, Building 3445, West Chamber) and the MTV exterior. The interior of the MMD-1 process trailer and MSM will be air monitored and decontaminated as necessary.
3. Air monitoring will be used to confirm the absence of chemical agents or phosgene on decontaminated surfaces and equipment. Air monitoring results will be compared against time-weighted average (TWA) values listed in **Table 9-1**. Air monitoring detection limits shall be less than TWA values. If results do not meet the closure performance standards, decontamination will be performed.
4. Rinse waters (from clean water rinsing after decontamination) will be sampled and analyzed to verify clean closure. If results are above closure performance standards (**Table 9-1**), equipment or areas will be decontaminated until deemed clean.
5. Collecting, characterizing, and managing waste decontamination solutions, rinse waters, and other wastes generated from closure activities.
6. Certifying clean-closure of the MMD-1 system and associated equipment.

**Table 9-1. Closure Performance Standards**

Media and Parameters		Performance Standard
<u>Rinse Waters*:</u>		
Sarin (GB)		20 ppb
VX		20 ppb
Mustard (HD)		200 ppb
<u>Air Samples<sup>a</sup>:</u>	<u>mg/m<sup>3</sup></u>	<u>ppmv</u>
Mustard (HD)	0.003	0.00045
Sarin (GB)	0.0001	0.00002
VX	0.00001	0.0000009
Phosgene (CG)	0.4	0.08

NOTES:

a Standards are considered exceeded when concentration results from at least two cycles of MINICAMS<sup>7</sup> or 4, 6, 8, 12, or 24 hour DAAMS sampling are above 1.0 TWA concentration values.

mg/m<sup>3</sup> = milligram per cubic meter

ppb = parts per billion

ppmv = parts per million by volume at 20EC and 1 atmosphere

Wipe sampling and analysis for chemical agents may be performed to augment the air monitoring sampling and analysis used to identify areas of contamination. If performed, wipe samples will be collected

according to ASTM E1728-95 or U.S. Corp of Engineers Manual EM 200-1-3, A Surface Wipe Sample Method.® Wipe sample results would only be used as a qualitative means of determining the presence or absence of chemical agent.

Once the MMD-1 is certified clean closed, it will be demobilized for re-use. Demobilization involves removing all process skids and support equipment used during the MMD-1 test from Building 3445 and removing the equipment from DPG. If during demobilization, process areas or equipment (for example, piping, tubing, cracks and crevices, or skidmounts) are discovered that may be contaminated, these areas or equipment will be decontaminated and air monitored to verify decontamination.

Wastes generated from closure activities will be containerized, characterized, and managed in a less than 90 day storage area, pending shipment offsite to an approved TSDF. The types of wastes expected to be generated from closure activities include: rinse waters; decontamination solutions; used personal protection equipment; wipes, rags, and other absorbent materials used in decontamination activities; and MMD-1 pump reservoir fluids, hydraulic fluids, and spent activated carbon from the MMD-1 carbon filtration system equipment. All carbon filters used in the MMD-1 system will be removed and managed as P999 hazardous wastes. The Building 3445 carbon filters need not be removed unless the carbon is spent.

### 9.1.3 Closure Sequence

During closure, the MMD-1 system and associated equipment and structures will be monitored to ensure that there are no residual chemical agents or phosgene, and will be decontaminated, if required.

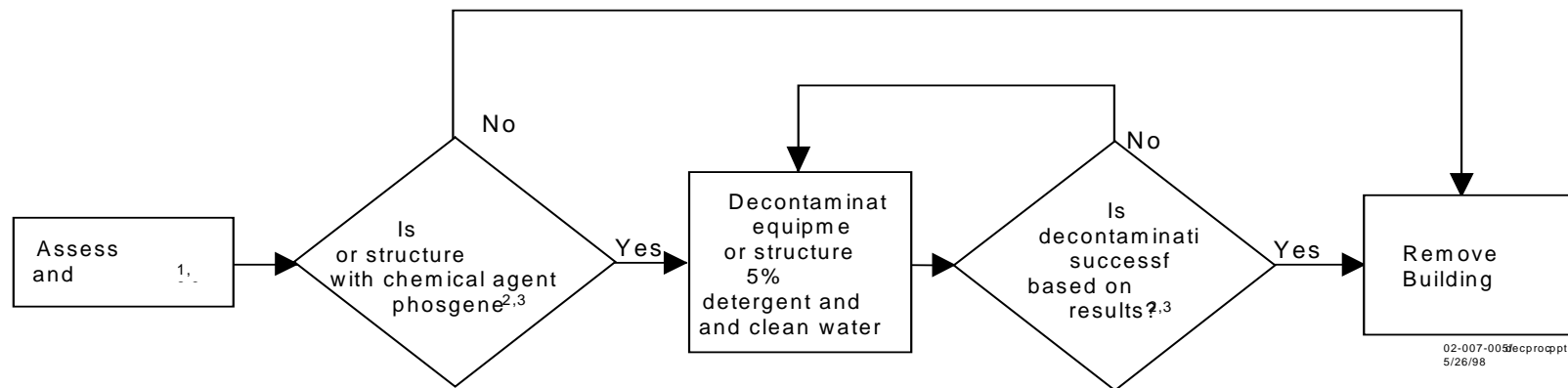
Closure activities will begin by identifying contaminated areas, structures, or equipment of the MMD-1 system, followed by decontamination (if required) and verification of decontamination activities. **Figure 9-5** presents the decision process that will be used to determine clean closure. In general, the order of closing the MMD-1 system, equipment, and structures is as follows:

1. The MMD-1 process trailer including the surge tanks
2. UPA
3. MMD-1 equipment skids (15)
4. MSM
5. Building 3445 West Chamber less than 90 day waste storage area.

With the exception of the MMD-1 process trailer and surge tanks, the remaining MMD-1 items listed above may be closed in parallel or in sequence of each other.

Once the MMD-1 system and associated equipment have been certified clean closed and removed, Building 3445 will be monitored and cleaned according to DPG Building 3445 Standing Operating Procedures and readied for routine operations.





#### NOTES

<sup>1</sup>Contamination of equipment or will be determined by air monitoring analytical results, review of the operating log, inspection knowledge

<sup>2</sup>Air monitoring for chemical agents or phosgene is performed to the workspace of an isolated area for structures or of the headspace MINICAM®, DAAM, or colorimetric .

<sup>3</sup>Sample and analyze rinse for presence of chemical. Compare results to closure performance standards for

**Figure 9-5. General Decision Process for Clean Closure**

## 9.2 CLOSURE PERFORMANCE STANDARD [40 CFR 264.111; R315-8-7]

The performance standards to be met in conducting clean closure of the MMD-1 are as follows:

- \$ Decontamination (if necessary) of the physical structures of the MMD-1 system, UPA, MSM, and Building 3445 West Chamber less than 90 day waste storage area so that no chemical agent or phosgene residues remain at concentrations above the air monitoring standards and rinse water concentration values set in **Table 9-1**.
- \$ Collection, characterization, and management of decontamination solutions, rinse waters, and other wastes generated by closure activities, for disposition offsite at an approved commercial TSDF, as outlined in the waste analysis plan.

Clean closure of the MMD-1 system, MSM, UPA, process trailer, and Building 3445 West Chamber less than 90-day storage area will be deemed complete when air monitoring and rinse water sampling results are below closure performance standards identified in **Table 9-1**. Air will be monitored for specific periods as detailed in **Table 9-4**, at or above 70°F.

Closure performance standards for air monitoring of chemical agents and phosgene are based on headspace vapor sampling and analysis and are established as 8-hour TWAs that are equivalent to workplace exposure limits. The TWA values are established by the U.S. Army Surgeon General as the permissible exposure level for workplace activities and indicate the concentration at which exposure to that chemical for 8 hours a day, 40 hours per week, will not cause adverse effects.

The Building 3445 West Chamber less than 90 day water storage area will also be air monitored, then decontaminated, if necessary.

During closure, sampling will be biased toward areas of known spills or leaks and where processing and handling of chemical agent or phosgene has occurred. As each of the MMD-1 system items are deemed clean, they will be removed from Building 3445.

Upon closure of the MMD-1 system and associated equipment and structures, there will be no hazardous wastes or hazardous waste constituents, including decontamination wastes, remaining. Prior to beginning closure, all treatment residues and related wastes will be removed from the MMD-1 system, UPA, MSM, and Building 3445 and shipped offsite to an approved hazardous waste TSDF. All wastes generated during closure activities (for example, spent decontamination solutions) and rinse waters will be containerized, sampled, analyzed, characterized, and managed appropriately, based on waste classification and in accordance with applicable regulatory requirements. Rinse waters will be managed as F999 hazardous waste.

Any contaminated areas, structures, or equipment relating to the MMD-1 system and test activities will be decontaminated using a bleach (5 percent) and/or detergent solution, or other appropriate decontamination agent as referenced in Field Manual (FM) 3-5 followed by a water rinse. The use of bleach (or hypochlorite) is a standard decontamination technique for chemical agent contaminated non-porous surfaces (metal, glass, plastic, etc.). Bleach has been shown to be an effective decontaminant for mustard, G and V agents, and has been documented in several research studies and published technical books such as *Decontamination Techniques for Buildings, Structures, and Equipment*, M.P. Esposito et al., R. Clark et al., Noyes Data Corporation 1987. Also the Environmental Protection Agency has identified chemical oxidation using various reagents including hypochlorite (for example, bleach) as the preferred or Best Demonstrated Available Technology for the treatment or decontamination of hazardous waste debris

contaminated with organics (see 40 CFR 268.48, table 1 - Alternative Treatment Standards for Hazardous Debris). The decontaminated areas will be sampled to confirm that the cleanup activities have removed the hazardous constituents of concern to the established closure performance standards. Confirmational sampling will consist of sampling using MINICAMS<sup>7</sup>, Depot Area Air Monitoring System (DAAMS), or colorimetric tubes for chemical agents and phosgene. Rinse waters will also be sampled and analyzed for chemical agent. **Table 9-2** summarizes the sampling and analysis methods that will be used to identify contamination and confirm satisfactory decontamination. Air monitoring for chemical agent is the preferred and best means to determine residual agent contamination on equipment and structures. If any chemical agent is present on surfaces following decontamination, it would off-gas. Off-gasing of chemical agent would be detected by air monitoring.

Decontamination will be performed until air monitoring and rinse water analytical results are below the closure performance standards (see **Table 9-1**).

**Table 9-2. Summary of Confirmatory Sampling and Analysis Methods**

Sample Source	Number of Samples	Sampling Method	Analytical Parameters	Sample Container	Sample Collection Preservative	Analytical Method	Sample Holding Time
Headspace gas sample of Building 3445, East Chamber, MMD-1 process trailer, equipment skids (15), UPA, MSM, and Building 3445 West Chamber temporary waste storage area	<u>Three</u> samples for each equipment, structure, or space	MINICAMS <sup>7,a</sup> , DAAMS	Chemical agents	NA	NA	MINICAMS <sup>7,a</sup> , DAAMS	NA
			Phosgene	NA	NA	Colorimetric <sup>b</sup>	NA
Rinse Waters	Two	Grab	Chemical Agents GB, VX, and HD	WM glass TeflonJ -lined cap	Cool, 4°C (39°F)	Army Method <sup>c</sup>	<u>30 days</u> <sup>d</sup>

NOTES:

- a Air Monitoring System for the Munitions Management Device Version 1 (MMD-1) Standing Operating Procedures (SOP), September 1996.
- b Dräger Safety, Inc. - Phosgene 0.25/c "Determination of Phosgene in Air Instructions for Use 234-283e" 15th edition, February 1996, or equivalent Army method.
- c Operation Numbers 1, 2, and 3 in TOCDF Laboratory Operating Procedure Number TE-LOP-572 for spent decontamination solution analysis or DPG Chemical Test Division Method CL-001R. Analytical method detection limits for rinse waster shall be capable of detecting chemical agent at the concentrations in Table 9-1.
- d Holding time requested by DSHW.

DAAMS = Depot Area Air Monitoring System  
 MSM = Munition Service Magazine  
 NA = not applicable  
 UPA = Unpack Area

### 9.3 MAXIMUM WASTE INVENTORY [40 CFR 264.112(a)(1); R315-8-7]

The estimated maximum inventory of wastes that may be present at MMD-1 at any time during its operation is presented in **Table 9-3**. This estimate is based on the maximum capacity to store liquid and solid hazardous wastes and the maximum quantity of chemical agent or industrial chemical for 1 week of operation.

### 9.4 DISPOSAL OR DECONTAMINATION OF EQUIPMENT, STRUCTURES, AND SOILS [40 CFR 264.112(b)(3), 264.114; R315-8-7]

The structures, equipment, and areas that may require decontamination include:

- \$ Spill areas
- \$ MMD-1 process trailer and treatment equipment, including waste storage (surge tanks)
- \$ MTV munitions load and unload area
- \$ MMD-1 support utility equipment skids located inside Building 3445, East Chamber (15 skids)
- \$ MMD-1 UPA located inside Building 3445, East Chamber
- \$ MSM
- \$ Building 3445 West Chamber less than 90 day waste storage area and reagent transfer pump skid.

**Table 9-3. Maximum Inventory of Wastes**

Location	Media	Waste Quantity
Munition Service Magazine	Gas, Liquid, Solid	500 gallons
UPA	Liquid, Solid	130 gallons
MTV, LRV	Liquid	610 gallons
Surge Tanks (2)	Liquid	350 gallons <sup>a</sup>
Building 3445 West Chamber	Liquid	1,750 gallons <sup>b</sup>
TOTAL		3,340 gallons

**NOTES:**

a Approximate storage capacity of surge tanks.

b Approximate storage capacity of reagent storage tanks and bulk waste storage containers

LRV = liquid reactor vessel

MTV = munitions treatment vessel

UPA = Unpack Area

Before beginning closure, all MMD-1 process wastes will have been removed from the MMD-1 and Building 3445 for offsite management at an approved hazardous waste TSDF. Closure and clean closure verification activities will begin with the MMD-1 process trailer and processing equipment (including the MTV, LRV, and surge tanks), followed in sequence or concurrently by the MMD-1 support utility equipment, UPA, MSM, and Building 3445 West Chamber less than 90 day waste storage area.

The following paragraphs describe the decontamination activities that may be conducted if contamination is identified during closure. Soil contamination is not expected to be encountered during closure as the MMD-1 system and associated equipment and structures will be located inside an enclosed structure, thus precluding any means to contaminate soil.

#### **9.4.1 MMD-1 Process Trailer**

After completing chemical detoxification operations, the MMD-1 system will be flushed with an appropriate decontamination solution, such as a 5 percent general bleach, followed by a water rinse. The MMD-1 system reactor vessels will then be allowed to air-dry. On initiating closure, the MMD-1 system (for example, equipment and ambient air inside the MMD-1 process trailer) will be air monitored for one 4-hour period at or above 70°F for the presence of surface contamination from chemical agents HD, GB, or VX and phosgene. Rinse waters will be sampled and analyzed for chemical agent. If air monitoring and rinse water analytical results are less than the closure performance standards, the MMD-1 system will have been successfully decontaminated. If analytical results exceed the performance standards in **Table 9-1**, decontamination will be repeated until performance standards are met. When the performance standards have been met, the interior of the MMD-1 process trailer will be deemed clean.

If the exterior is contaminated, a manual wipe-down will be performed using a detergent solution followed by a bleach solution wipe-down, then a clean water wipe-down. Air and rinse water sampling will be conducted to determine clean closure. If sampling results meet the closure performance standards, then the exterior of the process trailer will be deemed clean. If results are above closure performance standards, then decontamination will be repeated until the standards have been met.

#### **9.4.2 Unpack Area**

The UPA will be decontaminated using a spray wash or manual wipe-down. Air monitoring and rinse water sampling and analysis will be conducted in the same manner as described for the MMD-1 process trailer.

#### **9.4.3 Munition Service Magazine**

The MSM will be decontaminated using a spray wash or manual wipe-down. Air monitoring and rinse water sampling and analysis will be performed in the same manner as described for the MMD-1 process trailer. If contamination is still present, decontamination will be repeated and confirmatory sampling performed until deemed clean.

#### **9.4.4 MMD-1 Equipment Skids**

An MMD-1 equipment skid will be decontaminated by spray wash or manual wipe-down. Following decontamination, the equipment skid will be covered with chemical-agent-tight plastic, then air monitored for chemical agents and phosgene. Rinse waters will also be sampled and analyzed for chemical agent. If

contamination is still present, decontamination will be repeated and confirmatory sampling performed until deemed clean.

#### **9.4.5 Building 3445 West Chamber Less Than 90 Day Waste Storage Area**

The floor of the Building 3445 West Chamber less than 90 day waste storage area will be decontaminated using both a bleach and detergent solution spray wash followed by a clean water rinse. Air monitoring and rinse water sampling and analysis will be conducted to confirm that the area is clean. For air monitoring, the ventilation in the West Chamber will be closed and the air sampled for chemical agents and phosgene. Rinse waters will be sampled and analyzed for chemical agent. If contamination is still present, decontamination will be repeated and confirmatory sampling performed until deemed clean.

#### **9.4.6 MMD-1 Carbon Filter Systems**

After the MMD-1 equipment and structures have been deemed clean (but prior to the MMD-1 demobilization), filters in the MMD-1 carbon filter systems will be removed, bagged in plastic, monitored using MINICAMS<sup>7</sup> or DAAMS and containerized for shipment offsite to an approved hazardous waste TSDF. Following removal of the filters, the interior of the filter cabinet will be monitored. If chemical agent or phosgene is detected above closure performance standards (see **Table 9-1**), decontamination will be conducted and repeated until levels are reduced to concentrations less than the closure performance standards. In the event a carbon filter is found to be off-gassing chemical agent above the values listed in **Table 9-1**, the filter will be managed consistent with the DPG Chemical Agent Waste Management Plan.

### **9.5 CLOSURE OF THE MMD-1 [40 CFR 270.23(a)(2); R315-8-16]**

As detailed above, closure of the MMD-1 system will involve removal of all wastes, identifying contaminated MMD-1 system equipment and structures and decontaminating contaminated equipment and structures located in the process trailer and within Building 3445. Decontamination will be conducted using a general purpose decontamination solution (for example, detergent and water, and/or a 5 percent bleach or other appropriate decontamination solution as referenced in FM 3-5), followed by a water rinse, then air monitored to confirm successful decontamination. When air monitoring and rinse water sampling results meet closure performance standard levels (see **Table 9-1**), the MMD-1 system will be considered clean. If results are above established closure performance standards, additional decontamination and confirmatory sampling will be performed until closure performance standards are met. Decontamination will be effected by means of a high pressure spray wash, wet vacuum, or manually wiping down an area or equipment piece using cloths or wipes. There will be no MMD-1 equipment or process wastes remaining at Building 3445 following clean closure. Following removal of all decontamination residues and completion of confirmatory sampling, the MMD-1 system will be prepared for demobilization and reuse.

#### **9.5.1 Sampling to Confirm Decontamination and Determine Clean Closure**

Air monitoring and rinse water sampling will be conducted to confirm decontamination and determine clean closure. Air samples will be monitored for chemical agents and phosgene using MINICAMS<sup>7</sup> or DAAM, or colorimetric tubes. Rinse waters will be collected in appropriate containers depending on the volume or location of the rinse water collection. For example, rinse waters from the MTV and LRV will be collected in the surge tanks. Other rinsates may be collected by 5 gallon pails or wet-vacuum and placed in 5 gallon to 55 gallon containers.

MMD-1 equipment and structures will be deemed clean closed when air monitoring and rinse water sample results meet the closure performance standards presented in **Table 9-1**. Air sampling will be biased towards areas where known spills have occurred and where processing and handling of chemical agent or phosgene have occurred.

The following paragraphs describe how air monitoring will be conducted and how rinse water samples will be collected.

### 9.5.2 Air Sampling of Structures or Equipment

For structures, workspace air will be sampled. For equipment skid items, the skids will be enclosed in chemical-agent-tight plastic and the headspace in the enclosed space will be sampled. Depending on whether the item to be sampled is a structure or equipment, certain sampling conditions and sampling procedures will be performed. **Table 9-4** summarizes these air sampling requirements.

Air monitoring samples will be collected using MINICAMS<sup>7</sup> or DAAMS, or colorimetric tubes. The collection and analysis of confirmational air samples will also be conducted as required.

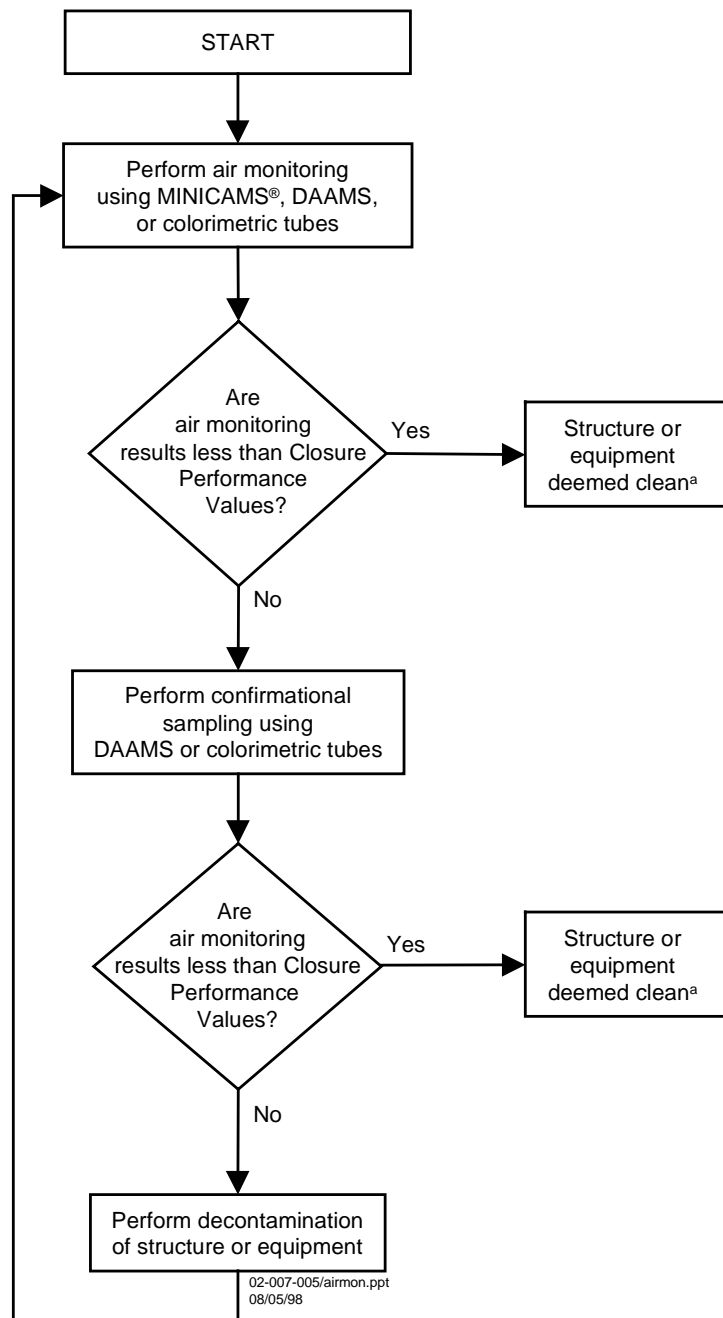
Air monitoring results will be compared to the closure performance standards in **Table 9-1**. If results are equal to or above the closure performance standards, confirmatory samples will be collected to determine if the MMD-1 structure or equipment item requires decontamination.

**Figure 9-6** depicts the decision process for sampling events using MINICAMS<sup>7</sup>, DAAMS, or colorimetric tubes including confirmational sampling.

**Table 9-4. Air Monitoring Requirements**

Item	Air Monitoring Sampling Conditions
<u>Structures</u>	Isolate workspace where structure is located by turning off ventilation in structure for:
Building 3445 Test Chamber	24 hours at or above 70°F before monitoring
Unpack Area	8 hours at or above 70°F before monitoring
Munition Service Magazine	8 hours at or above 70°F before monitoring
Process Trailer (Interior)	8 hours at or above 70°F before monitoring
(Exterior)	8 hours at or above 70°F before monitoring
<u>Equipment</u> Skid-mounted	Isolate equipment item by enclosing in plastic and allowing headspace in the enclosure to reach equilibrium for 4 hours at or above 70°F before sampling. After the conditions listed in this table are established, MINICAMS <sup>7</sup> , DAAMS, or colorimetric tubes samples will be collected. If results are below values in <b>Table 9-1</b> , the area or equipment item is considered clean closed.





<sup>a</sup>Meets or exceeds U.S. Army 3X criteria.

**Figure 9-6. Air Monitoring Flow Process for Meeting Closure Performance Standards**

### 9.5.3 Rinse Water Sample Collection

Rinse water samples will be collected from the surge tanks and various smaller sized containers. The smaller sized containers will range in size from 5 to 55 gallons. For the surge tanks, the tank contents will be recirculated and grab samples collected from the discharge line. For samples collected from containers, grab samples will be collected using a Coliwasa or dipper, or other suitable non-reactant collection device.

All rinse water samples will be placed in an appropriate container, labeled with sample identification number, date of sample collection, name of sample collector, sample location, and parameter for analysis (chemical agent). Samples will be sent to the onsite Mobile Chemistry Lab (MCL) along with its chain-of-custody form. Quality assurance (QA) and quality control (QC) for rinse water samples will be as described in Appendix 4C of this permit application.

### 9.6 ANCILLARY CLOSURE ACTIVITIES [40 CFR 264.112(b)(5); R315-8-7]

Since detoxification operations will occur within the process trailer under engineering controls, it is not expected that any hazardous constituents will be released outside the process trailer. In addition, the process trailer and support utilities will be located inside Building 3445, which will act as a further barrier to prevent any hazardous constituents (liquids or vapors) from migrating outside of the building confines. The MSM is an enclosed structure, thus preventing hazardous constituents (liquids or vapors) from being released and precluding any runoff or run-on concerns. Closure activities will include air monitoring to verify clean closure of the MMD-1 and its reuse, and will verify that further maintenance and control is not required. For these reasons, ancillary closure activities, including groundwater monitoring and run-on and runoff control, etc., will not be necessary.

### 9.7 SCHEDULE FOR CLOSURE [40 CFR 264.112(b)(6); R315-8-7]

The anticipated year of closure is 1999. The Executive Secretary, Utah Department of Environmental Quality (UDEQ), will be notified in writing at least 45 days prior to the date that any final closure operations are planned to begin. All closure activities will be completed within 165 days after receiving the final volume of materiel to be detoxified.

The projected schedule for closure of the MMD-1 system is as follows:

<b><u>Activity</u></b>	<b><u>Day Completed</u></b>
Initiate closure activities	Day 0
Identify contaminated structures and equipment	Day 14
Perform decontamination of the MMD-1 system, associated structures and equipment and, if decontamination is necessary, collect wastes generated from decontamination operations	Day 21
Complete confirmatory sampling and analysis of structures and equipment (if decontamination conducted)	Day 30
Review and evaluate sample analysis results.	Day 50
Complete decontamination of the MMD-1 system, associated structures and equipment for reuse.	Day 60
Ship all wastes generated from closure to an approved hazardous waste TSDF	Day 75
Complete all closure activities	Day 85
Submit closure certification to the UDEQ	60 days after completion of closure

#### **9.7.1 Extension for Closure Time [40 CFR 264.113(a) and (b); R315-8-7]**

Planned closure activities are not expected to exceed 145 days. No extension is requested at this time.

#### **9.8 CERTIFICATION OF CLOSURE [40 CFR 264.115; R315-8-7]**

Within 60 days after completing closure of the MMD-1, the U.S. Army will submit to the Executive Secretary, UDEQ, Solid and Hazardous Control Board, certification signed by the Small Burials Contractor (SBC) and DPG Commander (or a designee) and an independent State of Utah registered professional engineer, that the MMD-1 system, associated structures and equipment has been closed in accordance with the specifications stated in the approved Closure Plan. The closure certification will be accompanied by the following statement, signed by the U.S. Army (as owner) and the SBC (as operator):

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to be the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

The following information will be submitted to the Executive Secretary for approval to document that the MMD-1 system is cleaned closed: 1) manifests; 2) operating records showing that all wastes have been characterized and managed according to the waste analysis plan; 3) chemical agent results for waste rinse waters and decontamination solutions; 4) air monitoring analytical results showing that the MMD-1 system meets the closure performance standards presented in **Tables 9-1 and 9-2**; 5) a list of the areas and equipment identified for sampling during contamination assessment.

A final inspection of the clean-closed MMD-1 system will be conducted by the Executive Secretary or his representatives. The Executive Secretary may require further sampling and analysis of certain areas or equipment.

#### **9.9 POST-CLOSURE PLAN [40 CFR 264.118; R315-8-7]**

A post-closure plan is not applicable as the MMD-1 is not a land disposal unit per 40 CFR 264.118 (R315-8-7).

#### **9.10 CLOSURE COST ESTIMATE [40 CFR 264.143; R315-8-8]**

The MMD-1 is owned by the Federal Government and operated by the SBC; therefore, the MMD-1 is exempt from providing a closure cost estimate.

## **9.11 CLOSURE PLAN AMENDMENTS [40 CFR 264.112(c); R315-8-7]**

A copy of the approved Closure Plan and supporting documentation will be maintained inside the MMD-1 control trailer and at the U.S. Army DPG Environmental Office until closure is completed and certified.

The Closure Plan will be amended whenever:

- \$ Changes in operating procedures or wastes treated affect the Closure Plan
- \$ Unexpected events occur during closure activities that affect the Closure Plan
  
- \$ Changes occur in State of Utah or Federal regulations that affect the Closure Plan.

To obtain authorization to amend the Closure Plan, a written notification or request for permit modification (as appropriate) will be submitted to the Executive Secretary, UDEQ. The written notification or request will be submitted in accordance with 40 CFR 264.112(c) to include the applicable procedures in 124 and 270 and in particular in the following situations:

- \$ 60 days prior to a proposed change in operations
  
- \$ No later than 30 days after an unexpected event has occurred that affects the Closure Plan.  
(A permit modification request will be submitted no later than 30 days after an unexpected event occurs during closure.)